June 4, 2009

Tim Nogler
Managing Director
Washington State Building Code Council
128 Tenth Street SW.
Olympia, WA 98504-8350

Subject: Proposed statewide amendment of 2009 IBC Sections 2107.1 and 2107.2 (Log 09-246)

Dear Tim:

The purpose for this letter is to submit written comments to the Washington State Building Code Council in opposition to the proposed statewide amendment of the Washington State Building Code identified as Log #09-246. The applicant is the Northwest Concrete Masonry Association and the proponent is Tom Young, Executive Director. These comments represent my personal thoughts and opinions on the proposed amendment and are not those of Reid Middleton, Inc., or the Structural Engineers Association of Washington for which I am a member and serve as chair of the Building Engineering Committee.

The proposed amendment modifies Sections 2107.1 and 2107.2 of the 2009 International Building Code (IBC). IBC Section 2107 applies to the design of masonry structures using allowable stress design (ASD). IBC Section 2107.1 requires compliance with IBC Section 2106 (not a subject of this comment) and Chapters 1 and 2 of TMS 402/ACI 530/ASCE 5 except as modified by IBC Sections 2107.2 through 2107.5. The 2008 TMS 402/ACI 530/ASCE 5 is a reference standard of the 2009 IBC. This standard is commonly referred to as the MSJC, which stands for the Masonry Standards Joint Committee. MSJC-08 Chapter 1 contains general design requirements for masonry (not a subject of this comment). MSJC-08 Chapter 2 applies to the allowable stress design of masonry.

The proposed amendment changes IBC Section 2107.1 by also requiring compliance with IBC Section 2107.2 except as modified by IBC Sections 2107.3 through 2107.5. The amendment also changes IBC Section 2107.2 by deleting the current text and replacing it with requirements related to IBC Section 1605.3. I will refer to the IBC sections modified by the proposal as Sections 2107.1 and 2107.2 of the Washington State Building Code (WSBC).

The deleted text in WSBC Section 2107.1 deletes MSJC-08 Section 2.1.2.1. This section specifies load combinations for use in allowable stress design "when the legally adopted building code does not provide load combinations." The 2009 IBC, however, contains load combinations for use in allowable stress design and are found in IBC Section 1605.3. Because of this, MSJC-08 Section 2.1.2.1 does not apply in jurisdictions that adopt the 2009 IBC. This is also the case in the 2006 IBC and MSJC-05 Section 2.1.2.1. In the state of Washington, the "legally adopted building code" is currently the 2006 IBC and is slated to be the 2009 IBC beginning July 1, 2010.

This lack of applicability of MSJC-08 Section 2.1.2.1 eliminates the possibility of utilizing the load combinations of MSJC-08 Section 2.1.2.1 for the design of structures in the state of Washington but, as stated above, IBC Section 2107.2 also deletes MSJC-08 Section 2.1.2.1. By deleting the deletion of MSJC-08 Section 2.1.2.1 in IBC Section 2107.2, the proposed amendment effectively retains MSJC-08 Section 2.1.2.1 but does not also modify this section so that the load combinations therein are applicable in jurisdictions where the IBC is the "legally adopted building code," such as in the state of Washington. What would be accomplished by a statewide amendment that deletes the text in IBC Section 2107.2?

The proposed amendment replaces the deleted text in WSBC Section 2107.2 with a requirement that structures and portions thereof "be designed to resist the most critical effects resulting from the load combinations of (IBC) Section 1605.3" and "when using the alternative load combinations of (IBC) Section 1605.3.2 that include wind or seismic loads, allowable stresses are permitted to be increased by one-third." IBC Section 1605.3 serves as a title to IBC Sections 1605.3.1 and 1605.3.2. IBC Section 1605.3.1 (not a subject of this comment) specifies (basic) load combinations for use with allowable stress design and requires structures and portions thereof to be designed to resist the most critical effects resulting from those load combinations. IBC Section 1605.3.2 specifies alternative basic load combinations that are permitted to be used in lieu of the basic load combinations in Section 1605.3.1 and states that "when using the alternative basic load combinations that include wind or seismic loads, allowable stresses are permitted to be increased or load combinations reduced where permitted by the material chapter of this code (IBC) or the referenced standards" (e.g., MSJC-08).

The proposed amendment specifies the "alternative load combinations of Section 1605.3.2 but IBC Section 1605.3.2 specifies these as "alternative basic load combinations." The proposed amendment permits allowable stresses to be increased but IBC Section 1605.3.2 permits allowable stresses to be increased "or load combinations reduced." Are these differences between the proposed amendment and IBC Section 1605.3.2 intentional or are they inadvertent errors by the proponent?

In the proposed amendment, WSBC Section 2107.2 requires structures and portions thereof to "resist the most critical effects resulting from the load combinations of (IBC) Section 1605.3." As stated above, IBC Section 1605.3 specifies basic and alternative basic load combinations for use with allowable stress design. IBC Section 1605.2, however, specifies load combinations for use with strength design or load and resistance factor design. The requirement in WSBC Section 2107.2 that structures or portions thereof "be designed to resist the most critical load effects resulting from the load combinations of (IBC) Section 1605.3" effectively prohibits structures or portions thereof in the state of Washington from being designed to resist the most critical load effects resulting from the load combinations of IBC Section 1605.2 for strength design or load and resistance factor design. Design of structures utilizing load combinations for strength design and load and resistance factor design are commonly used by design professionals and have been in use for approximately 40 years. They have also been permitted by the building codes adopted in the state of Washington since the State Building Code Act first went into effect. Why is such design being prohibited by the proposed amendment?

The background information for the proposed amendment states that, because of the load combinations in IBC Chapter 16, there is no need to delete MSJC-08 Section 2.1.2.1, this deletion causes confusion for designers and it is not necessary. In order for a statewide amendment of the Washington State Building Code to be implemented, it should meet one of four criteria: (1) it is needed to address a critical life/safety need; (2) it is needed to address a specific state policy or statute; (3) it is needed for consistency with state or federal regulations; (4) it is needed to address a unique character of the state; or (5) it corrects errors or omissions. I do not agree that any of these criteria are met by deleting the deletion of MSJC-08 Section 2.1.2.1 in IBC Section 2107.2 and there is nothing in the background information that would indicate which of the criteria would be met by the proposed amendment.

IBC Section 2107.1 clearly deletes MSJC-08 Section 2.1.2.1. Undoing this deletion would not reduce confusion; it would increase confusion. MSJC-08 Section 2.1.2.1 is deleted in IBC Section 2107.1 because the load combinations in MSJC-08 Section 2.1.2.1 do not apply in the IBC, which already has load combinations. Also, MSJC-08 Section 2.1.2.1 clearly states that the load combinations therein apply "when the legally adopted building code does not provide load combinations," which is not the case in the IBC because it already has load combinations.

The background information states that the "additional language directs the code user to the allowable stress design load combinations in (IBC) Chapter 16." This is an incorrect statement. The proposed text in WSBC Section 2107.2 does not direct users to IBC Chapter 16 but does require design in accordance with the load combinations of IBC Section 1605.3 for use with allowable stress design and, as explained above, effectively prohibits design in accordance with the load combinations of IBC Section 1605.2 for use with strength design or load and resistance factor design.

The background information goes on to state that the additional language "clarifies the permissible one-third increase in allowable stresses when using the alternative (basic) load combinations." In making this statement, the proponent appears to assume that a one-third increase in allowable stresses when using the alternative basic load combinations of IBC Section 1605.3.2 is permitted. Such an increase, however, is not permitted, either in the 2009 IBC or in 2008 MSJC. As explained above, IBC Section 1605.3.2 permits allowable stresses to be increased or load combinations reduced for alternative basic load combinations that include wind or seismic loads, where permitted by a material chapter of the IBC (e.g., Chapters 18-23) or a referenced standard of the IBC (i.e., listed in Chapter 35). Other than the presumptive load-bearing values for soils in Table 1806.2, the IBC does not permit such increases.

A one-third increase in allowable stresses when using the alternative basic load combinations is also not permitted in the primary structural reference standards of the 2009 IBC, including, but not limited to, the "Minimum Design Loads for Buildings and Other Structures" (ASCE 7-05), "Specifications for Structural Steel Buildings" (AISC 360-05), "Building Code Requirements for Structural Concrete" (ACI 318-08), "Building Code Requirements for Masonry Structures" (TMS 402-08/ACI 530-08/ASCE 5-08), "Seismic Provisions for Structural Steel Buildings" (AISC 341-05), "North American Specification for the Design of Cold-formed Structural Steel Members" (AISI S100-07), "North American Standard for Cold-formed Steel Framing: Lateral Design" (AISI S213-07), "National Design Specification for Wood Construction" (NDS-05), and "Special Design Provisions for Wind and Seismic" (SDPWS-08).

The inclusion of the 2008 edition of the MSJC in the list above is intentional. This standard does not permit a one-third increase in allowable stresses when using the alternative basic load combinations of IBC Section 1605.3.2. In Section MSJC-08 2.1.2.3, increases of one-third in allowable stresses and allowable loads are permitted "when considering "Load Combinations (c), (d) or (e) of (MSJC-08) Section 2.1.2.1" but, as explained above, MSJC-08 Section 2.1.2.1 limits these load combinations to use with a legally adopted building code that not provide load combinations, which is not the case with the 2009 IBC, and 2009 IBC Section 2107.1 deletes MSJC-08 Section 2.1.2.1.

In conclusion, I am opposed to the approval by the Washington State Building Code Council of the statewide amendment of Sections 2107.1 and 2107.2 of the 2009 International Building Code (IBC) as proposed by the Northwest Concrete Masonry Association (Log 09-246).

Sincerely,

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